

## CLAIMS

What is claimed:

1. An sample collection vessel assembly for chromatographic systems, comprising:  
a vessel extender, attached to a collection vessel, so that a mobile phase flow stream enters the vessel extender and fills the collection vessel,  
wherein the vessel extender provides a volumetric capacity to hold the mobile phase flow stream beyond the volumetric capacity of the collection vessel.
2. The collection vessel assembly of claim 1, wherein the vessel extender comprises a mouth at an attachment end of the vessel extender meets a mouth at an attachment end of the collection vessel to provide a flow path for the mobile phase flow stream to enter the collection vessel.
3. The collection vessel assembly of claim 1, wherein the vessel extender sealably attaches to the collection vessel with a threaded connection.
4. The collection vessel assembly of claim 1, wherein the vessel assembly sealably attaches to the collection vessel with an external coupling.
5. The collection vessel assembly of claim 4, wherein the external coupling attaches to an external flange on an attachment end of the vessel extender and attaches to an attachment end of the collection vessel.
6. The collection vessel assembly of claim 5, wherein a mouth of the vessel extender extends into the collection vessel until the external flange contacts the mouth the collection vessel.

7. The collection vessel assembly of claim 1, further comprising:  
a housing, holding the collection vessel within the housing, that attaches to the vessel extender at an attachment end to provide a flow path for the mobile phase flow stream to enter the collection vessel from the vessel extender.
8. The collection vessel assembly of claim 1, wherein the vessel extender comprises an attachment end to receive an attachment end of the collection vessel, and  
the vessel extender comprises an extended mouth that protrudes into the collection vessel.
9. The collection vessel assembly of claim 1, wherein the vessel extender comprises a cylindrical body with a reduced-diameter mouth at an attachment end that meets a mouth of a collection vessel to form a flow path.
10. The collection vessel assembly of claim 1, wherein the vessel extender is fabricated from inert material that is not significantly hydroscopic.
11. The collection vessel assembly of claim 10, wherein the fabrication material includes plastic such as one of the following: polytetrafluoroethylene, polymer, polypropylene, polyethylene, or polyurethane.
12. A collection vessel assembly, comprising:  
a collection vessel for collecting liquid phase from a chromatographic mobile phase flow stream;  
a vessel extender, sealably attached to the collection vessel, such that the vessel extender and collection vessel form a flow path for the liquid phase to flow through the vessel extender and into the collection vessel,  
wherein the vessel extender provides volumetric storage capacity for liquid phase beyond the volumetric capacity of the collection vessel.

16. A method for extending the volumetric capacity of a collection vessel in a chromatographic collection system, comprising:

forming an extended volumetric capacity for the collection vessel by attaching a vessel extender to a collection vessel such that liquid phase from a mobile phase flow stream flows through the vessel extender and into the collection vessel and holds overflow from the collection vessel; and

sealing an attachment between the collection vessel and the vessel extender to prevent leakage of liquid phase from the vessel extender.

17. The method of claim 16, wherein said attaching comprises externally coupling the collection vessel and the vessel extender together.

18. The method of claim 16, wherein said attaching comprises extending a mouth of the vessel extender into a mouth of the collection vessel.

19. The method of claim 16, further comprising:

holding the collection vessel in a housing; and

attaching the housing to the vessel extender such that the attachment end of the vessel extender meets an open mouth of the collection vessel to form a flow path.